

**ABSTRACT**

A plurality of antenna elements, each of which has first and second linear conductors whose first ends are electrically interconnected are formed. The antenna elements are arranged in plane in such a way that the first and second linear conductors are alternated and separated from one another at regular intervals, thereby forming one or more array antennas which are disposed in a chamber. The second ends of the first linear conductors are connected to a high-frequency power supply, and the second ends of the second linear conductors are connected to ground. A plurality of substrates are parallel placed on both sides of the array antennas at distances approximate to the distances between the linear conductors. A film is formed by introducing an ingredient gas into the chamber.